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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,087	03/18/2004	Mitsuru Hasegawa	PHCF-04015	4164

21254 7590 11/07/2008
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EXAMINER	
ZERVIGON, RUDY	
ART UNIT	**PAPER NUMBER**
1792	
MAIL DATE	**DELIVERY MODE**
11/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/803,087	HASEGAWA ET AL.	
	Examiner	**Art Unit**	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _01 August 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1,3-6,8,9,11-14 and 16-20_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1,3-6,8,9,11-14 and 16-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the Appeal Brief filed on August 1, 2008, PROSECUTION IS HEREBY REOPENED. New Grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Parviz Hassanzadeh/

Supervisory Patent Examiner, Art Unit 1792

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 5, 6, 9, 11, 14, and 17-20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yamaguchi, Ryosuke et al. (JP 06010142 A). Yamaguchi teaches a semiconductor film formation device (Figure 7), comprising: a reaction vessel (lower half of 21; Figure 7, translation [0002]) that includes a gas flow path (31,27,28; Figure 7, translation [0002]) to allow a source gas (30,24; Figure 7, translation [0002]) to pass through, a substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) upon which to mount a substrate (25; Figure 7, translation [0002]) being provided in the gas flow path (31,27,28; Figure 7, translation [0002]) inside the reaction vessel (lower half of 21; Figure 7, translation [0002]), said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) being located on an inside surface of said reaction vessel (lower half of 21; Figure 7, translation [0002]) along a first side (lower half of 21) of said reaction vessel (lower half of 21; Figure 7, translation [0002]); a heater (23; Figure 7, translation [0002]) that is disposed along only a single side of said reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on said first side (lower half of 21) along which the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) inside the reaction vessel (lower half of 21; Figure 7, translation [0002]) is mounted; a cooling device (upper half of 21; Figure 7, [0005]) that is disposed along only a single side of said reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on a second side substantially directly opposite to the heater (23; Figure 7, translation [0002]), said cooling device (upper half of 21; Figure 7, [0005]) controlling an internal temperature of the reaction vessel (lower half of 21; Figure 7, translation [0002]) in a first section (volume above 32; Figure 7) of the gas flow path (31,27,28;

Figure 7, translation [0002]) where the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) is located; and a thermal conductivity adjusting member (32; Figure 7) that is disposed between the reaction vessel (lower half of 21; Figure 7, translation [0002]) and the cooling device (upper half of 21; Figure 7, [0005]), wherein the thermal conductivity adjusting member (32; Figure 7) allows the first section (volume above 32; Figure 7) along the gas flow path (31,27,28; Figure 7, translation [0002]) where the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) is located to have a thermal conductivity different from that of a second section (upstream portion of lower 21) along the gas flow path (31,27,28; Figure 7, translation [0002]), in order to lower a thermal diffusion effect of the source gas (30,24; Figure 7, translation [0002]) in the first section (volume above 32; Figure 7) thereby forming a temperature gradient in the reaction vessel (lower half of 21; Figure 7, translation [0002]) by providing a difference in temperature between regions of the reaction vessel (lower half of 21; Figure 7, translation [0002]), as claimed by claim 1. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Yamaguchi further teaches:

i. The semiconductor film formation device (Figure 7) according to claim 1, wherein: the first section (volume above 32; Figure 7) comprises an interspace (volume above 32; Figure 7) formed between the reaction vessel (lower half of 21; Figure 7, translation [0002]) and the thermal conductivity adjusting member (32; Figure 7), as claimed by claim 3

ii. The semiconductor film formation device (Figure 7) according to claim 1, wherein: the first section (volume above 32; Figure 7) comprises a material having a thermal conductivity that is different from a thermal conductivity of a material of the second section (upstream portion of lower 21), as claimed by claim 5

iii. A semiconductor film formation device (Figure 7), comprising: a reaction vessel (lower half of 21; Figure 7, translation [0002]) that includes a gas flow path (31,27,28; Figure 7, translation [0002]) to allow a source gas (30,24; Figure 7, translation [0002]) to pass through and a substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) on an inside surface of the reaction vessel (lower half of 21; Figure 7, translation [0002]) to mount a substrate (25; Figure 7, translation [0002]) in the gas flow path (31,27,28; Figure 7, translation [0002]), said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) of being located on a first side (lower half of 21) of said reaction vessel (lower half of 21; Figure 7, translation [0002]); a heater (23; Figure 7, translation [0002]) that is disposed along only one side of the reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on said first side (lower half of 21) of the reaction vessel (lower half of 21; Figure 7, translation [0002]) as the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) is located, the heater (23; Figure 7, translation [0002]) thereby being close to the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]); and a cooling device (upper half of 21; Figure 7, [0005]) to control an internal temperature of the reaction vessel (lower half of 21; Figure 7, translation [0002]) in a section of the gas flow path

(31,27,28; Figure 7, translation [0002]) wherein the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) is located, the cooling device (upper half of 21; Figure 7, [0005]) disposed along only one side of the reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on a second side of said reaction vessel (lower half of 21; Figure 7, translation [0002]) substantially directly opposite to said first side (lower half of 21) of said reaction vessel (lower half of 21; Figure 7, translation [0002]) that the heater (23; Figure 7, translation [0002]) is located, wherein a wall thickness (height of 32) of the reaction vessel (lower half of 21; Figure 7, translation [0002]) is smaller in the section along the gas flow path (31,27,28; Figure 7, translation [0002]) where the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) is located, thereby forming an interspace (space occupied by 32) between the reaction vessel (lower half of 21; Figure 7, translation [0002]) and the cooling device (upper half of 21; Figure 7, [0005]) to lower a thermal diffusion effect of the source gas (30,24; Figure 7, translation [0002]) in the section of the gas flow at the location of the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]), thereby forming a temperature gradient in the reaction vessel (lower half of 21; Figure 7, translation [0002]) by providing a difference in temperature between regions of the reaction vessel (lower half of 21; Figure 7, translation [0002]), as claimed by claim 6. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

iv. A semiconductor film formation device (Figure 7), comprising: a reaction vessel (lower half of 21; Figure 7, translation [0002]) that includes a gas flow path (31,27,28; Figure 7, translation [0002]) to allow a source gas (30,24; Figure 7, translation [0002]) to pass through and a substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) provided in the gas flow path (31,27,28; Figure 7, translation [0002]) to mount a substrate (25; Figure 7, translation [0002]), said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) being located on an inside surface of said reaction vessel (lower half of 21; Figure 7, translation [0002]) along a first side (lower half of 21) thereof; a heater (23; Figure 7, translation [0002]) that is disposed along only a single side of the reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) along said first side (lower half of 21) and close to the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]); a cooling device (portion 21 above 31,28; Figure 7) that is disposed along only a single side of the reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on a second side (above 32; Figure 7) of said reaction vessel (lower half of 21; Figure 7, translation [0002]), said second side (above 32; Figure 7) being substantially directly opposite to the first side (lower half of 21) of said reaction vessel (lower half of 21; Figure 7, translation [0002]) along which said heater (23; Figure 7, translation [0002]) is located, the cooling device (portion 21 above 31,28; Figure 7) controlling an internal temperature of the reaction vessel (lower half of 21; Figure 7, translation [0002]) in a vicinity of the substrate (25; Figure 7, translation [0002]) mount

site (29; Figure 7, translation [0002]); a plate member (32; Figure 7) that is disposed along said second side (above 32; Figure 7) of said reaction vessel (lower half of 21; Figure 7, translation [0002]) opposite to the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) in the gas flow path (31,27,28; Figure 7, translation [0002]); and a thermal conductivity adjusting member (31,28; Figure 7) that is disposed between the cooling device (portion 21 above 31,28; Figure 7) and the plate member (32; Figure 7), wherein the thermal conductivity adjusting member (31,28; Figure 7) provides a first section (space occupied by 32; Figure 7) along the gas flow path (31,27,28; Figure 7, translation [0002]) with a thermal conductivity different (via different gases above and below) from a second section (upstream portion of lower 21) along the gas flow path (31,27,28; Figure 7, translation [0002]), to lower a thermal diffusion effect of the source gas (30,24; Figure 7, translation [0002]) in the first section (space occupied by 32; Figure 7), <u>thereby forming a temperature gradient in the reaction vessel (lower half of 21; Figure 7, translation [0002]) by providing a difference in temperature between regions of the reaction vessel (lower half of 21; Figure 7, translation [0002]), as claimed by claim 9</u>

v. The semiconductor film formation device (Figure 7) according to claim 9 wherein: the first section (space occupied by 32; Figure 7) comprises an interspace (space occupied by 32) formed between the reaction vessel (lower half of 21; Figure 7, translation [0002]) and the thermal conductivity adjusting member (31,28; Figure 7), as claimed by claim 11

vi. A semiconductor film formation device (Figure 7), comprising: a reaction vessel (lower half of 21; Figure 7, translation [0002]) that includes a gas flow path (31,27,28; Figure 7,

translation [0002]) to allow a source gas (30,24; Figure 7, translation [0002]) to pass through and a substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) provided in the gas flow path (31,27,28; Figure 7, translation [0002]) to mount a substrate (25; Figure 7, translation [0002]), said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) being located on an inside surface of said reaction vessel (lower half of 21; Figure 7, translation [0002]) on a first side (lower half of 21) thereof; a heater (23; Figure 7, translation [0002]) that is disposed along only a single side of said reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) along said first side (lower half of 21) and close to the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]); a cooling device (portion 21 above 31,28; Figure 7) that is disposed along only a single side of said reaction vessel (lower half of 21; Figure 7, translation [0002]), outside of the reaction vessel (lower half of 21; Figure 7, translation [0002]) on a second side (above 32; Figure 7) thereof, said second side (above 32; Figure 7) being substantially directly opposite to the first side (lower half of 21) along which the heater (23; Figure 7, translation [0002]) is disposed, to control an internal temperature of the reaction vessel (lower half of 21; Figure 7, translation [0002]) in a vicinity of the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]); and a plate member (32; Figure 7) that is disposed along said second side (above 32; Figure 7), opposite to the substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]) in the gas flow path (31,27,28; Figure 7, translation [0002]), wherein the reaction vessel (lower half of 21;

Figure 7, translation [0002]) includes a wall thickness that is smaller in a first section (space occupied by 32; Figure 7) along the gas flow path (31,27,28; Figure 7, translation [0002]) than a wall thickness in a second section (upstream portion of lower 21), such as to thereby form an interspace (space occupied by 32) between the reaction vessel (lower half of 21; Figure 7, translation [0002]) and the cooling device (portion 21 above 31,28; Figure 7) to lower a thermal diffusion effect of the source gas (30,24; Figure 7, translation [0002]) in the first section (space occupied by 32; Figure 7), <u>thereby forming a temperature gradient in the reaction vessel (lower half of 21; Figure 7, translation [0002]) by providing a difference in temperature between regions of the reaction</u> vessel (lower half of 21; Figure 7, translation [0002]), as claimed by claim 14

vii. The semiconductor film formation device (Figure 7) according to claim 1, wherein said gas flow path (31,27,28; Figure 7, translation [0002]) is substantially parallel with an exposed upper surface of said substrate (25; Figure 7, translation [0002]) as mounted upon said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]), as claimed by claim 17

viii. The semiconductor film formation device (Figure 7) according to claim 6, wherein said gas flow path (31,27,28; Figure 7, translation [0002]) is substantially parallel with an exposed upper surface of said substrate (25; Figure 7, translation [0002]) as mounted upon said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]), as claimed by claim 18

ix. The semiconductor film formation device (Figure 7) according to claim 9, wherein said gas flow path (31,27,28; Figure 7, translation [0002]) is substantially parallel with an

exposed upper surface of said substrate (25; Figure 7, translation [0002]) as mounted upon said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]), as claimed by claim 19

x. The semiconductor film formation device (Figure 7) according to claim 14, wherein said gas flow path (31,27,28; Figure 7, translation [0002]) is substantially parallel with an exposed upper surface of said substrate (25; Figure 7, translation [0002]) as mounted upon said substrate (25; Figure 7, translation [0002]) mount site (29; Figure 7, translation [0002]), as claimed by claim 20

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 4, 8, 12, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi, Ryosuke et al. (JP 06010142 A). Yamaguchi is discussed above. Yamaguchi does not teach:

i. The semiconductor film formation device (Figure 7) according to claim 3, wherein: the interspace (space occupied by 32) has a varying height along the gas flow path (31,27,28; Figure 7, translation [0002]), as claimed by claim 4

ii. The semiconductor film formation device (Figure 7) according to claim 6, wherein: the interspace (space occupied by 32) has a height that varies along the gas flow path (31,27,28; Figure 7, translation [0002]), as claimed by claim 8

iii. The semiconductor film formation device (Figure 7) according to claim 11, wherein: the interspace (space occupied by 32) has a height that varies along the gas flow path (31,27,28; Figure 7, translation [0002]), as claimed by claim 12

iv. The semiconductor film formation device (Figure 7) according to claim 11, wherein: the first section (space occupied by 32; Figure 7) comprises a material whose thermal conductivity is different from that of a the second section (upstream portion of lower 21), as claimed by claim 13

v. The semiconductor film formation device (Figure 7) according to claim 14, wherein: the interspace (space occupied by 32) has a varying height along the gas flow path (31,27,28; Figure 7, translation [0002]), as claimed by claim 16

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the dimension and material of construction of Yamaguchi's first section / interspace (32).

Motivation to optimize the dimension and material of construction of Yamaguchi's first section / interspace (32) is for influencing heat transfer by Newton's law: q''=-Kx, where q is the heat flux (heat transfer per unit area), K is the thermal conductivity, and x is the vertical dimension of element 32.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Friday schedule from 9am through 5pm. The fax phone number for the organization where this application or proceeding is

assigned is 571-273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272- 1435

/Rudy Zervigon/

Primary Examiner, Art Unit 1792